Massive Open Online Courses at the University of Copenhagen

Experiences from the first two years

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By the University of Copenhagen´s MOOC Unit

Contents

Summary

MOOCs can help the University of Copenhagen achieve a number of key strategic goals

- The purpose of this initial project phase was to explore the Massive Open Online Course (MOOC) format, both technically and pedagogically, and identify possible ways that the format can support the University's strategy.
- The explorative approach has led to considerable capacity building within the University in regards to technical and pedagogical aspects of MOOC creation and implementation.
- A number of opportunities directly related to MOOCs, which are at the same time intimately connected with all the core responsibilities and activities of the University – research, education, sharing of knowledge – have been identified.
- During the first 2 years of partnership with Coursera, the University of Copenhagen has run 8 MOOCs in a total of 14 sessions.
- All the University's six faculties have been part of the project, both with participating lecturers and research groups and through membership of the project's steering committee.

The University of Copenhagen's MOOCs have reached hundreds of thousands of learners

- During the first two years of the project more than 320 000 learners signed up for the MOOCs offered by the University.
- Compared to the students at the University's study programmes the MOOC leaners are very diverse in respect to age, nationality, academic experience and employment status.
- The majority of learners on the University's MOOCs are well-educated professionals living in North America and Europe, with a significant minority (25-40 %) from emerging economies.
- Learners on the University of Copenhagen's MOOCs interact with the course materials in a variety of ways. Only a minority of learners start the courses with the intention of earning a certificate.
- The lecture videos are the most popular feature of the MOOCs. The lecture videos from University of Copenhagen's courses have been streamed or downloaded almost 3 million times.
- More than 16 000 learners earned a certificate for completing a course. That is 34 % of the learners who showed commitment by submitting at least one exercise.

Through MOOCs the University of Copenhagen can improve quality of relevance of study programmes

- A survey of lecturers involved in MOOC production at the University of Copenhagen shows that it has inspired many of them to improve their on-campus teaching. Many have also been inspired to include more online elements in their ordinary teaching, and they believe that MOOCs are a good way to improve the quality of education for students at the University of Copenhagen.
- Accordingly, this report identifies a number of ways in which students at the University of Copenhagen can profit from the University's investment in MOOC development.
- One MOOC was run simultaneously with an accredited course for campus students, in a blended format where the campus students followed the online course in combination with weekly sessions on campus with the lecturers. The course received very positive feedback from campus students, with 83 % saying they preferred the new blended format (4 % preferring traditional lecture based course).
- Another MOOC was used as a voluntary preparatory course for University of Copenhagen students starting at a new interdisciplinary MSc programme. This gave the newly enrolled students, who came from many different academic backgrounds, a chance to get better acquainted with their new field of study before the start of the first semester.

- Around each MOOC a large scale global community of learners is created. This community can be used actively to improve quality and relevance of education at the University, for instance by engaging them in thesis supervision, crowd-sourcing feedback on research and student projects, and global input to campus based courses.
- The learner data generated by the MOOCs can be used in research projects where we examine the effects of different instructional strategies, and these insights can be relevant not only in MOOCs but in all forms of teaching.
- Insights from the project have been disseminated inside the University of Copenhagen through a number of forums, most notably the 2016 Online and Blended Learning Project's network of (online) learning specialists.

MOOCs can be an efficient and meaningful medium for outreach, research dissemination, international recruitment, and branding

- University of Copenhagen can use MOOCs and other forms of open online education to build a meaningful relation to a great number of people who are genuinely interested in the core activities and output of the University.
- The MOOC format blurs the lines between education and research dissemination, with the thousands of online learners also being consumers of research news.
- Of the faculty, who had lectured on one of the University's MOOCs, 92 % agree that a MOOC is a good way to communicate research-based knowledge to the public.
- Findings indicate, that it is possible to recruit international students via MOOCs, but that more data is needed to explore this potential.
- Using the announcement system to email all learners is an extremely efficient way of getting strategic information, such as recruitment materials, out to a very large number of potential applicants to the University of Copenhagen's study programmes.
- Considering the demography of the online learners, it is mostly relevant to use MOOCs to recruit to MA, MSc, PhD and professional Master's degree programmes as well as international summer schools, Copenhagen Summer University and other courses within the University's continuing education portfolio.
- The MOOCs also have a great reach outside of the course room. The eight course descriptions have been shared almost 30 000 times on Facebook and almost 2 000 times on Twitter and 24 % of all tweets to the University's English Twitter account since the partnership was announced in February 2013 have been about Coursera.

Revenue from learners paying for verified accreditation can make course economy sustainable

- Some learners choose to pay a small amount to have their course credentials verified through the so-called Signature Track. The revenue from this is shared between Coursera and the University.
- Although just a small minority of the learners do this, the University's share is predicted to be sufficient to secure funding for updates, improvements and monitoring of the already existing MOOCs.
- Since the University of Copenhagen enabled Signature Track in June 2014 more than 1 200 learners have signed up for it.
- Currently around 0.9 % of learners signing up for one of the University of Copenhagen's MOOCs pay to enrol in the Signature Track. With the current revenue share this means that for every 100 000 learners signing up the University of Copenhagen will receive about DKK 150 000 (EUR 20 000) in revenue.
- This revenue is expected to rise as Coursera's new on-demand course model is adopted for all the University of Copenhagen's MOOCs in autumn 2015.

Continued investments in open online education can place the University of Copenhagen ahead of the curve

- Because of the University of Copenhagen's early start and substantial production, the University is now among just a handful of leading European universities when it comes to experience and know-how in relation to the MOOC format.
- The partnership with Coursera offers access to a huge global community of learners, as well as insights into newest research based innovations within educational technology and experience with a state-of-the-art online education platform.
- A comparison of leading MOOC platforms show that Coursera is still the best platform for the University of Copenhagen to host its MOOCs on. This is largely due to the fact that Coursera has four times more users than the second most popular platform.
- More knowledge about the many uses of MOOCs and the way a MOOC can support the work with certain strategic goals should help inform the selection of course topics.
- Many lessons learned from the work with MOOCs can be expanded to the entire field of open online education. By embracing open access and free sharing of knowledge the University could further expand its reach and strengthen meaningful relations with stakeholders and general public across the world.
- A survey among University of Copenhagen faculty who lectured on one of the MOOCs found that 75 % was in favour of the idea that the University share educational materials under a license that allows other lecturers, students and the general public to re-use the materials in other contexts.
- The large amount of data about how the learners interact with the course materials gives a previously unimaginable insight into how we learn. The University could leverage this by developing a focused research portfolio linked with open and online education, learner motivation, learner feedback and other related topics, to the benefit of quality and relevance of the University's study programmes.

Introduction

In 2012 a new trend emerged in higher education. With renowned American universities leading the way, professors would offer their courses online for free. Largely video-based, the truly new thing about these courses was the large number of participants. Learners, as they came to be called, would get feedback only from fellow learners and machine-evaluated quizzes, making it possible for a single professor to reach and teach virtually an unlimited amount of learners.

The new format was called massive open online courses, or MOOCs, with massive referring to the large number of simultaneous learners, and open meaning anyone can sign up and join the course free of charge. Being a new and largely unexplored format at the intersection of higher education and technology it received a healthy proportion of both tech-hype and criticism relating to everything from issues of low quality and high retention rates, to privacy and protection of learner data.

Despite the novelty and controversy of the format, the University of Copenhagen decided to enter into a partnership with the leading MOOC platform, Coursera. Following a four-month process the partnership contract was signed in December 2012, and the collaboration officially initiated in February 2013.

For the University of Copenhagen the purpose of the partnership was to explore ways in which large scale open online education can be a useful tool in the University's on-going work with a range of priority areas, such as improving quality and relevance of educational programmes, increasing outreach and dissemination of research based knowledge, and strengthening the University's brand internationally.

In the spring of 2013 the course production began, and the first of initially eight planned courses was launched in September 2013. By the end of January 2015, the last of the eight courses had finished its first session, and a total 14 sessions had been offered (between 1 and 3 from each course), resulting in over 320,000 learners signing up and viewing the lecture videos almost 3 million times.

## Structure and purpose of this report

Following the purpose of the project as an exploration of the possible uses of the MOOC format, this report will discuss the different opportunities, issues and challenges that we have identified, with the aim of qualifying the discussion of the question: should the University of Copenhagen offer open online education?

After two initial chapters with descriptions of the courses and learners, the main chapters of the report will be on discussing if the work with MOOCs can benefit the students in formal educational programmes offered by the University of Copenhagen, and a chapter exploring if open online education can be seen as a meaningful and efficient addition to the outreach, communication and branding-related activities of the University. The two final chapters of the report are outlining possible next steps, future developments, and recommendations.

The report is written by the University of Copenhagen's MOOC Unit, as requested by the University of Copenhagen Management Team when the project was initiated two years ago. The purpose of the report is to inform university management, as well as stakeholder's in- and outside of the University of Copenhagen about the experiences from the first two years of MOOC production at the University of Copenhagen. It does not represent the opinion of the management of the University of Copenhagen.

Sources of information

The data that is used in this evaluation comes from a variety of sources. Much of the quantitative data comes from the learner and course analytics offered by the Coursera platform. Input from lecturers comes from interviews with selected lecturers and course directors, as well as from an online survey that was distributed in February 2015 to the 57 lecturers from the University who has been involved in the project. Comparison between MOOC learners and applicants to the University of Copenhagen's study programmes used data from two separate online application systems, STADS-DANS and TopApply. To measure the reach outside of the course rooms we included data from Twitter, Facebook, and the Google Analytics account of the University of Copenhagen.
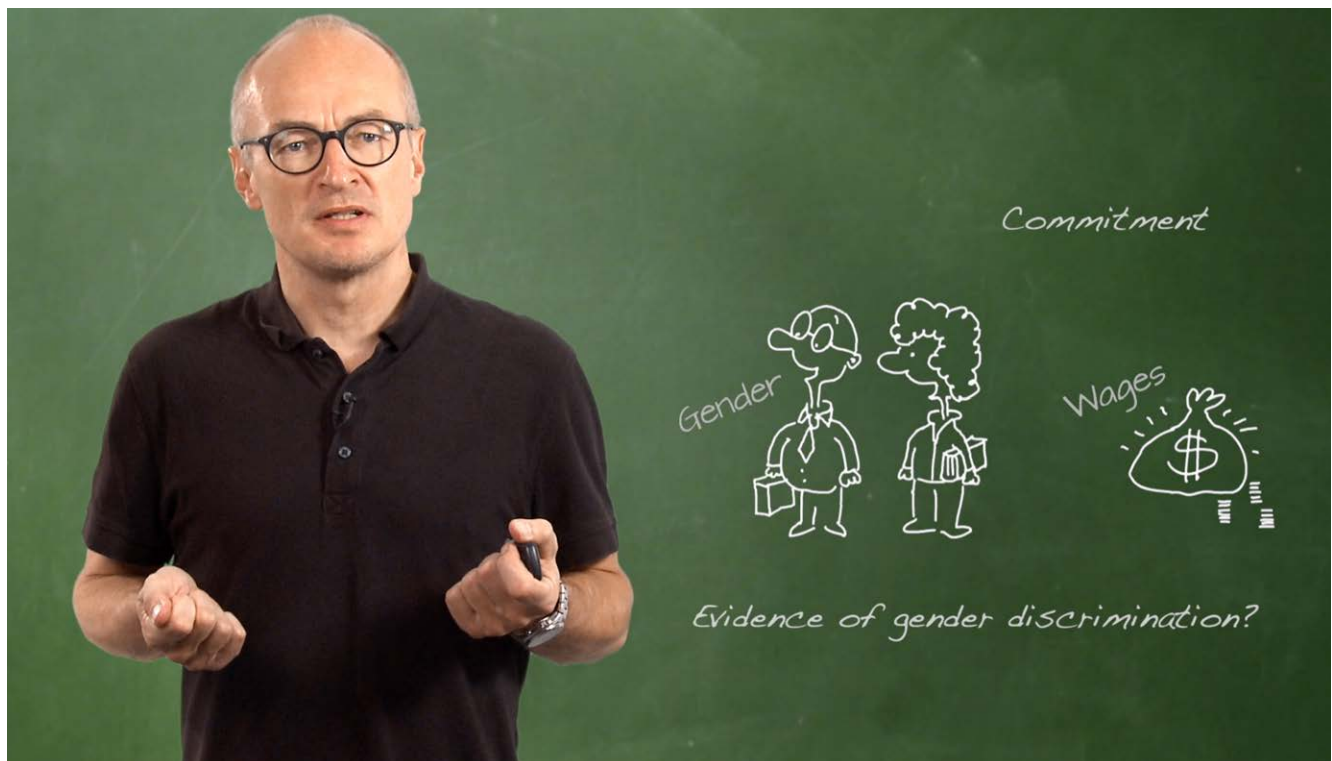
THE CAUSALEFFECTS COURSE USES ANIMATIONS AND GRAPHICS TO CONVEY COMPLEX CONTENT IN THE VIDEO LECTURES OF PROFESSOR ANDERS HOLM, DEPARTMENT OF SOCIOLOGY, UNIVERSTY OF COPENHAGEN.

Thank you

Although the everyday work on the project was centered on the MOOC Unit and in particular the production team, the majority of work, resources and attention put into this project comes from a long list of dedicated people across the University of Copenhagen and at Coursera. This truly has been a collective effort and at the MOOC Unit we would like to extend our thanks and appreciation to the colleagues from all of the University of Copenhagen's faculties as well as the central administration, which have offered their time, resources, ideas, experience and patience. In no particular order we would like to thank the deans and University Management; the current and previous members of the Steering Committee; Anni Søborg, Trine Højbjerg Sand, Berit Cecilie Brix, and Katja Pietras Nielsen from the University Education Services; Helle Britta Schønfeldt from the University Legal Office; Emma Webb, Ryan George and Daphne Koller from Coursera; and of course most of all the many lecturers, guest lecturers, course directors and course coordinators who graciously and patiently took part in this explorative project.

ON-LOCATION VIDEO LECTURE FROM THE KIERKEGAARD COURSE WITH ASSOCIATE PROFESSOR JON STEWART FROM THE SØREN KIERKEGAARD RESEARCH CENTRE, UNIVERSITY OF COPENHAGEN.

The courses

For the initial two year project period the University planned the production of eight courses, covering all of the University's six faculties, with the Faculty of Science and the Faculty of Health and Medical Sciences making two courses each.

At the end of this report there is a short description of each course.

As with traditional courses, MOOCs come in all shapes and sizes. At the University of Copenhagen a MOOC typically consists of short video segments with built-in quiz questions, weekly multiple-choice quizzes, peer-graded written assignments, discussion forums, and references to other open learning resources. The learner workload is between 3 and 7 hours/week.

Course name	Short name
An Introduction to Global Health	GLOBALHEALTH
Constitutional Struggles in the Muslim World	CONSTITUTIONAL
Diabetes – A Global Challenge	DIABETES
Measuring Causal Effects in the Social Sciences	CAUSALEFFECT
New Nordic Diet – from Gastronomy to Health	NEWNORDIC
Origins – Formation of the Universe, Solar System, Earth and Life	ORIGINS
Scandinavian Film and Television	SCANFILMTV
Søren Kierkegaard – Subjectivity, Irony and the Crisis of Modernity	KIERKEGAARD

TABLE 1: THE COURSES.
TITLES AND SHORT NAMES OF THE EIGHT MOOCS OFFERED BY THE UNIVERSITY OF COPENHAGEN ON THE COURSERA PLATFORM IN 2013-14.

The video segments are typically in the form of short lecture-like presentations or interviews, either filmed in a studio or on-location. The computer-evaluated multiple-choice quizzes provide instant feedback, and can either be used as formative assignments (for practice) or as graded assignments, which form part of the overall course result. The peer-graded written assignments (essays) offer more interesting didactic strategies than the multiple-choice quizzes, but also set some limitations to the flexibility of the learning experience. Discussion forums are both used actively to host discussions proposed by lecturers, and as a place where the learners can start their own discussions as well as seek help from each other. The other learning resources that are referenced in the courses are mostly in the form of readings, online databases and information portals, or elements from other open online courses.

These elements are all considered core elements of the Coursera platform and they constitute the backbone of all the University's MOOCs. However, because of the great diversity of the topics covered, and to explore the different features of the Coursera platform, the eight courses vary significantly in size and length, grading policy, learner communication strategy and academic level.

Sessions

On the current Coursera platform the courses run in sessions, with a start and end date. By the time of this evaluation all of the eight courses had run between 1 and 3 times, raising the total number of sessions to 14. In Table 2 there is an overview of the 14 sessions, and the main components.

PROFESSOR IB BONDEBJERG FROM THE SCANFILMTV COURSE.

Session	Start date	Length	Videos	Quizzes	Essays
CAUSALEFFECT-001	06-10-2014	5 weeks	5	11	0
CONSTITUTIONAL-001	02-12-2013	10 weeks	67	8	2
DIABETES-001	24-03-2014	8 weeks	24	7	1
DIABETES-002	02-09-2014	5 weeks	24	7	1
GLOBALHEALTH-001	02-09-2013	8 weeks	56	6	2
GLOBALHEALTH-002	03-06-2014	5 weeks	51	8	1
GLOBALHEALTH-003	04-11-2014	5 weeks	51	8	1
KIERKEGAARD-001	07-10-2013	8 weeks	26	8	1
KIERKEGAARD-002	06-10-2014	8 weeks	26	8	1
NEWNORDIC-001	21-10-2013	4 weeks	16	4	0
NEWNORDIC-002	07-04-2014	4 weeks	16	4	0
ORIGINS-001	10-11-2014	12 weeks	80	12	0
SCANFILMTV-001	03-02-2014	10 weeks	30	8	2
SCANFILMTV-002	02-09-2014	5 weeks	30	7	1

TABLE 2: OVERVIEW OF THE SESSIONS.
START DATE, LENGTH IN WEEKS, AND NUMBER OF LECTURE VIDEOS, QUIZZES AND PEER-GRADED ESSAYS FOR EACH OF THE 14 SESSIONS. SESSION NAMES ARE MADE OF THE COURSE SHORT NAME (SEE TABLE 1) AND THE SESSION NUMBER.

As can be seen from the table above, the most significant change between different sessions of the same course is that several long courses (8-10 weeks) were transformed into shorter versions (5 weeks), without significant changes to the amount of material, resulting in a shorter course with an increased workload. This was done to increase learner interaction with the materials while at the same time decreasing time and resources required from instructors and other course staff.

Production set-up

From the outset of the project the University chose to have one central MOOC Unit, which was responsible for both the day-to-day collaboration with Coursera and the actual course production. This unit then worked in close collaboration with the local academic units and research groups, who were creating courses on the platform. For the first 14 months the MOOC Unit was hosted at the University of Copenhagen's School of Global Health. This was partly because the School, on behalf of the University Management, had initiated the collaboration with Coursera and driven the partnership agreement process, and partly because of the staff and lecturers at the School had practical experience with both international education and production of online courses. From April 2014 the MOOC Unit was integrated into the newly formed Centre for Online and Blended Learning at the Faculty of Health and Medical Sciences, but remained the focal point for MOOC production and Coursera collaboration for all the University's six faculties.

As a strategic decision the University chose to go for high-end TV-like productions, rather than the webcam- or PowerPoint-based lectures, which are still normal in many MOOCs. This meant higher production costs, but was considered important, as one aim of the project was to brand the University and some of its strongest research groups internationally. For this, a professional look-and-feel, in sync with the University's design policy, was essential. Furthermore it was decided that all courses would be branded with the University's central colours and logo, rather than those of Faculties or local departments.

For one of the eight courses (CONSTITUTIONAL) the video production was outsourced to an external production house, but the other seven courses were planned, filmed and edited by the production team at the MOOC Unit. The large amount of lecture videos produced in a short time (237 videos in 21 months) has resulted in a significant capacity building within the university, and despite an ambitious outset in 2013 the production value of the lecture videos has risen dramatically, leading to a clear difference in quality between the videos produced in 2013 and the most recent productions.

Other roles in the MOOC production, such as platform expertise and instructional design, have also benefitted greatly from the large production, and it is unlikely that this level of capacity building and in-house expertise could have been achieved with a more decentralised organisation composed of several smaller production teams.

The learners

The course participants in MOOCs are most often referred to as *learners*. This helps differentiate them from *students*, a word which is reserved for persons that are enrolled in one of the University's accredited educational programmes.

The Coursera platform offers detailed data about the learners. This data includes information about both learner demography and learner activity (interaction with course materials). The following is a short sum up of learner data from the University of Copenhagen's courses on the Coursera platform. We shall refer to this data in coming chapters where we discuss MOOCs in relation to quality and relevance of education and outreach and communication.

Learner demography

The learner demographics of the courses offered by the University of Copenhagen matches the general user population on the Coursera platform, except for the gender distribution, where the University of Copenhagen's courses have a much higher percentage of female learners (53 % compared to the

	UCPH minimum	UCPH maximum
Learners that are students (part- of full-time)	28 %	43 %
Learners from emerging economies *	25 %	40 %
Learners with degree **	78 %	86 %
Learners below 25 years old	10 %	17 %
Learners between 25 and 34 years old	33 %	46 %
Learners above 34 years old	39 %	56 %

TABLE 3: LEARNER DEMOGRAPHY.
THE MINIMUM AND MAXIMUM VALUES RECORDED FOR SELECTED LEARNER DEMOGRAPHY ASPECTS ON THE 14 SESSIONS OF THE MOOCS FROM THE UNIVERSITY OF COPENHAGEN.

* *EMERGING ECONOMIES* IS A CATEGORY USED BY COURSERA, WHICH IS DEFINED AS "NON-HIGH-INCOME ECONOMIES UNDER THE WORLD BANK'S COUNTRY AND LENDING GROUPS CLASSIFICATIONS, AS WELL AS CHILE AND URUGUAY".

** *DEGREE* INCLUDES BACHELOR, MASTER, PROFESSIONAL, ASSOCIATE, AND DOCTORATE DEGREES.

40 % Coursera average). This difference can probably be explained by the fact that Coursera has a large proportion of engineering and computer science classes that traditionally tend to draw more male learners than the courses topics offered by the University of Copenhagen.

The average learner profile reflected by the Table 3 differs from the body of students at the University of Copenhagen's formal study programmes in many ways. Most significantly, the MOOC learners are a very international group, with a large minority living in emerging economies. The ten countries with most learners on the University of Copenhagen's MOOCs are (in this order): United States, United Kingdom, India, Canada, Brazil, China, Spain, Australia, Germany, and the Russian Federation.

Less than half are part- or full-time students, the vast majority already has a degree, and only a small minority is below 25 years old. In fact, the group more closely resembles life-long learners and professionals, who use the courses as either a way to gain new skills relevant for their careers or simply learn for their own enjoyment. A recent survey undertaken by Coursera shows that 88 % of the learners attributed some kind of career benefit (such as promotion or pay rise) as a motivation for signing up for a course.

It is however important to point out that given the large scale of the courses even small percentages can signify a large amount of learners, and that the learner population on all accounts is significantly more diverse than the students you will find in most formal educational settings.

Learner activity

An advantage of online learning is that it can give you very detailed data about the learners' interaction with the course materials.

An important thing to remember when looking at learner activity data is that learners interact with the course materials in a number of meaningful ways that are often not aimed at obtaining a certificate. This is especially relevant when looking at retention rates, that is, how many of the learners that sign up for a course end up completing all of it, and receiving a certificate.

Given the open nature of this kind of courses, it is not completely straightforward to determine when a person really joins a course with the intention to complete all assignments and earn a certificate. Is it when you click the "Join for free"-button on the course description page? Or is it when you enter the course room, watch your first video lecture, or do the first graded assignment?

As shown in the Table 4, 54 % of the people signing up for a course end up visiting the course room, and still fewer interact with the course in a way, where you can reasonably say that

Number of learners signing up	320 349
Number of learners who visited course	172 340
Number of learners who submitted exercise	49 406
Number of learners receiving a certificate	16 391
% of learners signing up who visited course	54 %
% of learners signing up who received certificate	5 %
% of learners submitting exercise who received certificate	34 %

TABLE 4: SIGN-UPS, RETENTION AND CERTIFICATES.
ACCUMULATED NUMBERS AND AVERAGES FROM ALL 14 SESSIONS, SHOWING RELATIONSHIP BETWEEN LEARNER ENGAGEMENT AND COMMITMENT.

they are intending to earn a certificate. A learner activity, that could indicate intention to earn a certificate, is if the learner submits an exercise (most often in the form of answering a 5-10 questions multiple-choice quiz). For the University of Copenhagen's 14 sessions the average percentage of exercise-submitting learners, who end up with a certificate is 34 %.

Aside from looking at sign-ups and certificates, the learner data from the Coursera platform also gives details about how much the learners interact with different types of learning materials on the different sessions. In many ways this is a more meaningful way of measuring the reach of the courses, as it catches both the learners who just watch the lectures, as well as the activity of learners that try out the tests and assignments and interact with the other learners on the course discussion forums. Table 5 shows the scale of three main categories of course activity across the 14 sessions.

Session	Lectures viewed	Exercises submitted	Forum posts made
CAUSALEFFECT-001	21 998	13 597	515
CONSTITUTIONAL-001	636 347	29 387	21 265
DIABETES-001	175 751	43 399	5 448
DIABETES-002	93 607	20 508	1 862
GLOBALHEALTH-001	268 537	38 897	9 310
GLOBALHEALTH-002	164 113	24 122	3 655
GLOBALHEALTH-003	124 676	20 345	5 584
KIERKEGAARD-001	200 472	26 400	8 593
KIERKEGAARD-002	124 854	16 698	4 813
NEWNORDIC-001	135 379	26 080	4 319
NEWNORDIC-002	64 943	12 508	2 626
ORIGINS-001	721 570	57 147	8 601
SCANFILMTV-001	146 828	28 861	3 945
SCANFILMTV-002	58 250	9 907	1 041
Total for all 14 sessions	**2 937 325**	**367 856**	**81 577**

TABLE 5: LEARNER INTERACTION WITH DIFFERENT CATEGORIES OF COURSE MATERIALS.
THE NUMBERS IN THE COLUMNS SIGNIFY NUMBER OF LECTURES STREAMED OR DOWNLOADED, NUMBER OF EXERCISES (E.G. QUIZZES OR ESSAYS) SUBMITTED, AND NUMBER OF POSTS AND COMMENTS MADE IN THE COURSE FORUMS FOR EACH OF THE 14 SESSIONS.

The great variation in learner activity generally reflects not just the number of learners signing up for the course, but also the course design and length. The two biggest courses in terms of learner workload and amount of material (ORIGINS-001 and CONSTITUTIONAL-001) are also the two sessions with the greatest level of learner activity. In fact, those two sessions alone account for 46 % of all video views, 24 % of exercise submissions and 37 % of all forum posts.

To examine how different delivery of the same course materials would influence the learner activity levels, we ran the three sessions of the GLOBALHEALTH course with some variation in regards to course length, grading policy and availability of course materials during course.

These results are of course very preliminary, but the tendency seems to be that changing the course length does not have much influence on the learner activity level. And somewhat surprising, releasing all material from day one of the course actually decreased the number of video lectures being watched. Finally, changing the grading policy, to award points for certain activities (that would otherwise be un-graded) seem to influence student activity, but only very modestly.

There are a plethora of other factors influencing learner activity levels, and experiments like these are just scratching the surface. At the same time, they show the great potential for generating quantitative data which can be used by education researchers who study how we learn e.g. by examining the relationship between instructional formats and learner motivation, and other topics which are relevant not only in MOOCs but in all forms of teaching.

	GLOBALHEALTH-001	GLOBALHEALTH-002	GLOBALHEALTH-003
Course length	8 weeks / 56 videos	5 weeks / 51 videos	5 weeks / 51 videos
Availability of material	Weekly releases of new course material	Weekly releases of new course material	Everything available from course start
Forum participation credits	0 points	Max 1 point	Max 8 points
Video views / visiting learner	17,94	16,94	14,34
Exercise submissions / visiting learner	2,60	2,49	2,34
Forum posts / visiting learner	0,61	0,38	0,64

TABLE 6: INFLUENCE OF COURSE DESIGN ON LEARNER ACTIVITY.
HOW CHANGING THE COURSE LENGTH, AVAILABILITY OF MATERIAL AND GRADING POLICY INFLUENCED LEARNER ACTIVITY ON 3 SESSIONS OF GLOBALHEALTH. THE TERM *VISITING LEARNER* SIGNIFIES A LEARNER WHO SIMPLY VISIT THE COURSE ROOM AT LEAST ONCE.

ASSOCIATE PROFESSOR HENNING HAACK FROM THE ORIGINS COURSE USING THE COLLECTION OF THE NATURAL HISTORY MUSEUM OF DENMARK IN HIS VIDEO LECTURES.

MOOCs and education

From the outset of the project a motivating factor was to explore if MOOCs could be an instrument in the University of Copenhagen's on-going work with improving relevance and quality of education for the more than 40 000 students that are enrolled in the University's courses and study programmes. With this in mind we encouraged the lecturers at the University's eight MOOCs to experiment with different ways of either re-using the learning materials produced for MOOCs in their teaching at the University of Copenhagen, or leveraging the diversity, massiveness, experience, network and knowledge of the learner communities around the MOOCs to enrich the experience of their students at the University.

In the following chapters we will describe and discuss some of these experiments. Furthermore we have examined, if the work with online education and creation of digital educational materials has influenced the teaching style of the involved lecturers, and inspired them to improve their teaching.

Lecturer competencies

To include the experiences of the lecturers in this evaluation, we distributed an online survey to the 57 lecturers from University of Copenhagen who lectured on one of the eight MOOCs. This includes academic staff, from PhD students to professors, and external lecturers, but excludes the 'guest lecturers' with no close relation to the University of Copenhagen.

The survey received 39 replies, representing both lecturers for whom the involvement was a couple of days' work, and course directors, who worked for several months on creating a great number of video lectures, assignments and other course elements.

For one of the questions the lecturers were asked if their work with MOOCs had inspired them to improve their teaching. For the entire group of lecturers 41 % mostly agree, 44 % are neutral, and 15 % mostly disagree. If you disaggregate it by the lecturers' degree of involvement in the project, it becomes clear that the more lecture videos a lecturer created, the more likely they are to agree that it has inspired them to improve their teaching.

These findings are supported by the replies to another question in the survey, where the lecturers are asked if the project has inspired them to include more online elements in their teaching. To this 42 % mostly agree, 39 % are neutral and 19 % mostly disagree.

"Teaching at a coursera course has inspired me to improve my teaching"	Mostly agree	Neutral	Mostly disagree
Lecturers creating 1 to 2 videos	36 % (8)	41 % (9)	23 % (5)
Lecturers creating 3 to 5 videos	40 % (4)	50 % (5)	10 % (1)
Lecturers creating more than 5 videos	57 % (4)	43 % (3)	0 % (0)
All lecturers	41 % (16)	44 % (17)	15 % (6)

TABLE 7: RELATION BETWEEN INVOLVEMENT IN MOOC PRODUCTION AND EFFECT ON TEACHING.
LECTURERS WERE ASKED HOW MUCH THEY AGREE WITH THE STATEMENT: "TEACHING AT A COURSERA COURSE HAS INSPIRED ME TO IMPROVE MY TEACHING".

We also asked them if they agree with the statement that creating MOOCs is a good way to improve quality of education for students at University of Copenhagen. Findings were similar to the questions above: The more experience the lecturers have with the MOOC format, the more they agree that the format can also be a benefit for the students at the University of Copenhagen.

The conclusion seems to be that the work with MOOCs does not only make lecturers rethink the teaching that they are doing on campus, it also opens their eyes for the possible benefits that campus students can have from the University's work with open online education. And the more involved the lecturer has been in the work with MOOCs, the stronger the effect.

"Creating an open online course (such as a Coursera course) is a good way to improve quality of education for UCPH students"	Mostly agree	Neutral	Mostly disagree
Lecturers creating 1 to 2 videos	20 % (4)	60 % (12)	20 % (4)
Lecturers creating 3 to 5 videos	40 % (4)	50 % (5)	10 % (1)
Lecturers creating more than 5 videos	71 % (5)	29 % (2)	0 % (0)
All lecturers	35 % (13)	51 % (19)	14 % (5)

TABLE 8: RELATION BETWEEN INVOLVEMENT IN AND PERCEIVED BENEFIT OF MOOC PRODUCTION.
LECTURERS WERE ASKED HOW MUCH THEY AGREE WITH THE STATEMENT: "CREATING AN OPEN ONLINE COURSE (SUCH AS A COURSERA COURSE) IS A GOOD WAY TO IMPROVE QUALITY OF EDUCATION FOR UCPH STUDENTS".

> "It has been a really good experience to develop and run our online diabetes course. In fact, we are now a group of lecturers who are looking into ways that we can use this experience to improve our normal lecturing here at University of Copenhagen. There are great potentials in blending online and offline methods, and that way get much more out of the time that we are spending together with the students."
>
> Professor Jens Juul Holst, the Novo Nordisk Foundation Center for Basic Metabolic Research, University of Copenhagen, and co-director of the DIABETES course

All these positive effects, however, are related to faculty, who themselves took part in the project. We have made no survey of lecturers unrelated to the project, and it is unlikely that any direct influence on teaching caused by the University's MOOC involvement can be measured outside of the departments involved in the production of MOOC materials.

To ensure that the insights generated from the project are spreading in the organization the MOOC Unit has presented findings and lessons-learned at several occasions and in many different forums across the University, such as the Education Day, the Online and Blended Learning Conference, the Head of Studies Forum, and at meetings in administrative departments responsible for online and blended learning, communications, study administration, and international students.

Flipped classroom

Among people working with online and blended learning, the *flipped classroom* signifies a certain format for blended learning where the one-way lecturing, or direct knowledge transfer from lecturer to student, is moved from the class room and into preparatory online elements, thereby freeing up time in class for active learning and application of the knowledge attained in the online module. It is called 'flipped'

because the traditional order of lectures and homework has been swapped around, so you do the homework together with the professor and your fellow students in class instead of alone after class.

As the only one of the eight courses ORIGINS is based on an actually campus course offered to students at University of Copenhagen by the Natural History Museum of Denmark. From the outset, the lecturers designed the MOOC to correspond to the length and content of the campus based course *Altings Oprindelse*, and combined the first session of ORIGINS and the autumn semester 2014 session of Altings Oprindelse into a flipped classroom course. In this the 32 students on the campus course were asked to prepare for class by following the corresponding modules of the ORIGINS course on Coursera.

One of the lecturers on the course, Assistant Professor Emily C. Pope, is currently evaluating the experience with input from students and lecturers. We have been given access to some of the survey data and they show that 96 % (n=27) of the students taking part in the evaluation find that the video lectures (from ORIGINS) were *valuable*, and 4 % (n=1) thought the videos were *mostly valuable*.

> "It was really nice to be able to follow the lectures at my own pace, and at whatever time of day suited me. Video lectures also mean you can repeat things as many times as you'd like, if you need to, which was handy!"
>
> Student feedback in the evaluation of the blended learning course *Altings Oprindelse*, which used lectures from ORIGINS as preparation for each session in class

When asked if they would prefer Altings Oprindelse to be taught the traditional way 83 % (n=19) of the students answered *no*, 4 % (n=1) answered *yes* and 13 % (n=3) were undecided. The positive student feedback is underlined by the results from examinations, which show that unlike previous years all students passed the course.

The very positive feedback from the students is not unanimously shared by the lecturers on the course. In the lecturer survey a third of the lecturers from ORIGINS disagreed on the more general statement that creating MOOCs is a good way to improve quality of education at the University. A better understanding of the lecturer experience in the flipped classroom experiment must wait for the evaluation of Emily C. Pope.

> "The solution is not to replace education with online education, but to replace the one-way communication that takes place in the auditorium with online modules. That will free up precious time at campus for discussions, exercises and other activities."
>
> Associate Professor Henning Haack, Natural History Museum of Denmark, University of Copenhagen, and course director of ORIGINS

This flipped classroom experiment is not the only instance where the learning materials from the MOOCs have been used to teach students at the University of Copenhagen. Less formalized models of blended learning, where individual videos have been made available to students before, after, or even during a class room session have been tried out. This usage is hard to track, because it is driven by the lecturers themselves and the high production-value of the lecture videos has meant that many lecturers are enthusiastic about the product and at their own initiative use them in many different contexts.

Preparation course

Because of the open access nature of MOOCs, that allows anyone to join without any admission process, they can be used strategically as preparation courses for applicants or newly enrolled students who still do not have access to the University's intranet and learning management system.

In the summer of 2014 all newly enrolled students in the University of Copenhagen's MSc in Global Health programme were encouraged to sign up for GLOBALHEALTH-002. Of the 39 enrolled students 12 signed up.

> "Doing the Global Health course on Coursera was a great preparation for the MSc in Global Health. It was a high quality course that gave me a good overview of the main topics that are covered in the study programme. It also inspired me to look further into some of the topics I found most interesting, so it was definitely worth it!"
>
> Giulia from Italy, who was a learner on GLOBALHEALTH before starting her MSc in Global Health studies at University of Copenhagen

Aside from creating a familiarity with the lecturing staff and the main themes and topics covered in the programme, the hope was that the MOOC would help create a common starting point in an interdisciplinary study programme like the MSc in Global Health, where the students come from a variety of academic backgrounds.

Interacting with the learner community

Aside from re-using the MOOC materials as online elements in campus based courses in traditional study programmes, there is also a great potential in using the global community of learners that evolve around each MOOC. As described above in the section about learner demographics, the learners on a MOOC are a very diverse group. One thing, however, that they do have in common is that they are interested in the subject matter of the course they signed up for.

Having access to thousands of people, interested in a subject that is also taught at the University of Copenhagen, offers many interesting ways of integrating the online learners with the students at a corresponding study programme, to the benefit of both groups.

Some formats use the students as subject matter experts, and let them contribute with presentations or create tasks or exercises for the online learners to solve. The opposite model, where the students benefit from the knowledge, knowhow and academic and professional networks of the global learner community, can be arranged in many ways.

At the GLOBALHEALTH course the community has been used to generate feedback for a number of different topics. Some were driven by students in the MSc in Global Health programme, who got feedback on thesis ideas or smaller research projects. Others have been driven by researchers from the Department of Public Health and the School of Global Health, who have used the learner community for feedback on topics of interest for their research.

Through the online learner communities of the MOOCs the students at the University of Copenhagen can get access to a global professional network of people who are eager to share their knowledge, network, experiences and ideas. We are still experimenting and looking for the best way to facilitate interaction between the community and the students but it is clear, that it is possible to generate extremely valuable feedback from the learners and integrate this *student-learner interaction* in the over-all strategy for improving relevance and quality of education at the University.

"I gained a lot from presenting my thesis project in the forum. Just the mere fact that I got so many responses, with all of them praising my project and offering support, gave me a lot of confidence that my thesis is headed in the right direction. I got a list of around 40 articles and books to read, multiple offers from organizations and people that I can contact or collaborate with, and also a ton of feedback that was constructive and useful."

Danielle, student at the University of Copenhagen's MSc in Global Health, who presented her thesis idea to the learner community at GLOBALHEALTH-002

ON-LOCATION VIDEO LECTURE FROM THE ORIGINS COURSE WITH ASSISTANT PROFESSOR EMILY POPE FROM THE NATURAL HISTORY MUSEUM OF DENMARK, UNIVERSITY OF COPENHAGEN.

MOOCs and outreach

The University of Copenhagen has many reasons to communicate and share knowledge with the rest of society and the world at large. Some of these are set down in the University's *2016 Strategy*, others are required by law (knowledge dissemination requirements in *Universitetsloven*), and still others are a means to an end, such as PR and branding initiatives to recruit excellent staff and students, support funding applications and promote key research areas internationally.

It is clear that the University is an active and integrated part of society, and the manner, efficiency and purpose of the University's communication both with specific stakeholders as well as with society at large is continuously being examined and improved. It is in this context, that we will now discuss if MOOCs can be seen as a meaningful and effective way of supporting some of the university's goals for outreach, branding and communication.

Strengthening university brand

International branding is a motivating factor for many universities working with open online education, and the Coursera platform is continuously implementing new functionality to increase and measure the branding-related institutional value of a partnership.

The massive reach of the MOOCs – with hundreds of thousands of learners actively engaging with course materials produced and moderated by the University's research groups – dwarves all other outreach activities made by the University. This scale of reach makes it worthwhile to examine how the course experience has influenced the learners' opinion of the University.
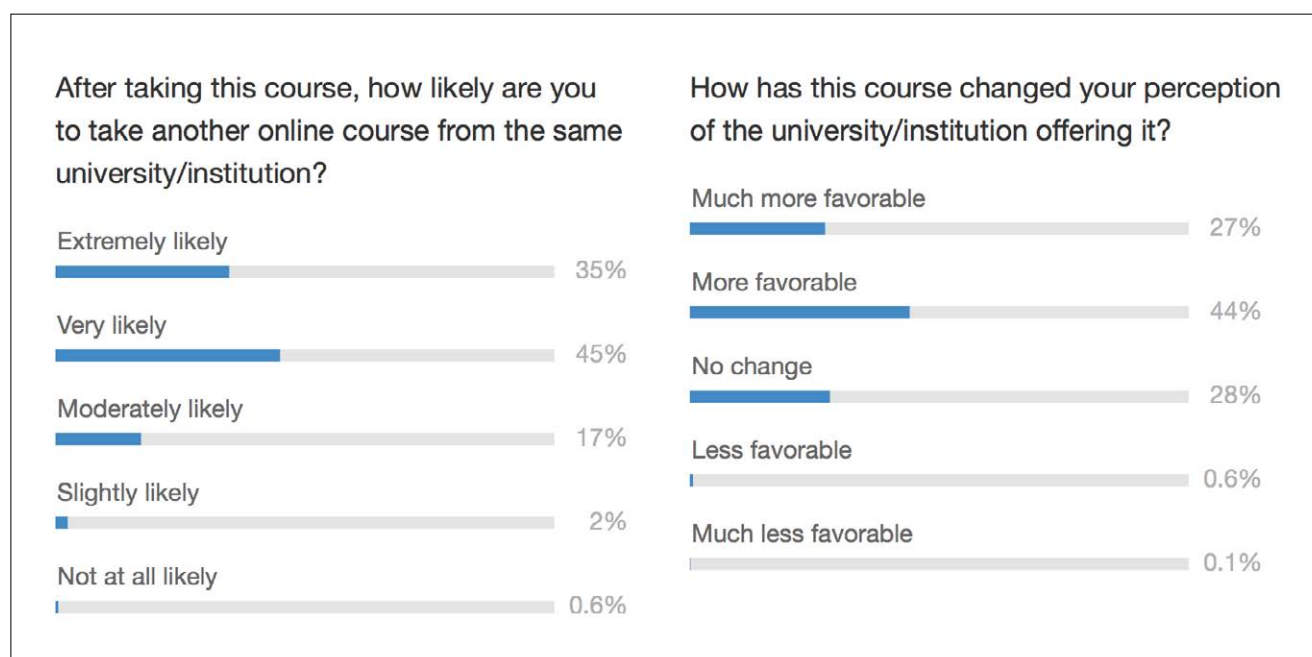
After taking this course, how likely are you to take another online course from the same university/institution?

Extremely likely — 35%

Very likely — 45%

Moderately likely — 17%

Slightly likely — 2%

Not at all likely — 0.6%

How has this course changed your perception of the university/institution offering it?

Much more favorable — 27%

More favorable — 44%

No change — 28%

Less favorable — 0.6%

Much less favorable — 0.1%

TABLE 9: UNIVERSITY BRANDING.
RESULTS FROM TWO OF THE BRANDING RELATED QUESTIONS FROM A QUICK QUESTIONS SURVEY AT THE ORIGINS-001.

In July 2014 Coursera introduced a Quick Questions functionality, which pushes a short survey to the learners after a certain threshold in the course. This survey asks learners to evaluate the course materials, but also asks them about their opinion of the institution offering the course. We do not have average numbers for all sessions, but on the most recent session (which with over 44 000 learners is also the largest session in the evaluation period), ORIGINS-001, 71 % of the learners replied that because of the course their perception of the University of Copenhagen was now more or much more favourable. And 80 % of the same learners indicate that they are very or extremely likely to take another MOOC from University of Copenhagen.

With regards to previous knowledge of the University of Copenhagen, there is great variation between the courses, but in a number of smaller in-session surveys we found that between 1/3 and 2/3 of the learners have never heard of the University of Copenhagen before joining one of our MOOCs.

Branding is of course a much more complicated concept, but it is clear that the University of Copenhagen, through these eight initial MOOCs, has reached hundreds of thousands of people that it would otherwise have had no relation to, and that the experience of these people, after engaging with the coursework is overwhelmingly positive.

Parallel to the branding connected to the courses and academic disciplines represented in the University of Copenhagen's course portfolio on Coursera there is also a possible positive effect on the University's brand, which can be derived from the fact that the University is a front runner in regards to integration and development of new educational technologies and instructional modalities. The experience and know-how that the University of Copenhagen has gained from being an early adopter and ensuring substantial investments in the project have placed the University in the vanguard of open online education in Europe.

This is also reflected in the many MOOC related presentations given by University of Copenhagen staff and faculty at different forums. Examples include:

- Coursera Partners Conference, London (March 2014)

- #EDUdisrupt Conference, Copenhagen (May 2014)

- European Association for International Education (EAIE) Annual Conference, Prague (September 2014)

- MOOC-seminar at Svenska Institutet, Stockholm (November 2014)

- UNICA Edulab Meeting, Lisbon (December 2014)

- Strategic Debate on E-learning at Bergen University, Bergen (March 2015)

Furthermore representatives from the University of Copenhagen has been invited as experts to present MOOC insights and project findings in a number of Danish forums, such as the Ministry of Higher Education and Science, the Danish Rectors' Conference, the Danish School of Media and Journalism, the Think Tank DEA, and the Danish Accreditation Institution.

Reach on social media
The Coursera platform allows easy sharing on different social media platforms and as of February 2015 the eight course descriptions have been shared almost 30 000 times on Facebook and almost 2 000 times on Twitter. These numbers do not include the great number of times that people have spread information about the University of Copenhagen's MOOCs without linking to the course description, so this extra-platform reach is even higher.

The Twitter impact can also be seen in the 605 tweets, which include both "@uni_copenhagen" (the name of University of Copenhagen's official English language Twitter account) and "coursera". This means that 24 % of all tweets mentioning @uni_copenhagen since the partnership was announced in February 2013 have been about Coursera.

For four of the courses (DIABETES, GLOBALHEALTH, KIERKEGAARD, and ORIGINS) the local course management and lecturers opened Facebook pages, to be able to communicate with the learners between sessions. As this evaluation is being made, these four Facebook pages have a total of 25 000 followers. For comparison the University of Copenhagen's official English Facebook page has around 3 200 followers. Add to this the thousands of learners who have joined self-established groups on Facebook and other social media, and it is clear that the reach of the courses extend far beyond the course rooms.

Common for these figures is that they illustrate how the University can use open online education to build a meaningful relation to a great number of people who are genuinely interested in the core activities and output of the University. It is hard, if not impossible, to put a value to this relation, but when it translates into real opportunities, such as recruiting students or disseminating findings from research projects, it becomes a little clearer.

Research dissemination
Using the MOOC as a medium for research dissemination is meaningful for both lecturers and learners, and attractive for research donors who want to make sure that the findings from the research they are funding are also shared outside of academic circles.

In the evaluation survey that was distributed to University of Copenhagen faculty, who had lectured on one of the University's MOOCs, 92 % (33 of 36) *mostly agree* with the statement that a MOOC is "a good way to communicate research-based knowledge to the public" (3 were *neutral*). Almost the same high agreement (86%, or 30 of 35) was found with the more branding-related statement that a MOOC is "a good way to highlight important UCPH research areas internationally".

The overwhelming support for MOOCs as a medium for research dissemination among lecturers possibly stems from the fact that the content can be delivered on the lecturers' own terms. Although the target group of the courses is the general public then the content does not have to live up to news criteria of main stream journalism, which we know from press releases, participation in news shows and other forms of research dissemination. Instead the content is edited and presented by the researchers and lecturers themselves, and can be improved in direct interaction with laymen and professionals that are interested in their field.

The MOOC format blurs the lines between education and research dissemination, with the community of learners also being *consumers of research news* and the course forums also being a global forum for discussion of new research findings - and for dissemination of the knowledge that is created at the University.

Up until now the communities have only lived as long as the course session was open, but on the new Coursera platform, that the University of Copenhagen's courses will migrate to during 2015, courses will no longer run in sessions but be available *on-demand*. This means that learners sign up for a course, and not just a session, and the community around one course will remain active and keep on growing (unless the course is taken down), and not be restarted every time a session is over. According to Coursera several of the courses that are already on the new on-demand platform have more than 100 000 registered learners. For a research group at University of Copenhagen to get this kind of reach would be a huge benefit, and open up a wealth of opportunities, including enhanc-

ing the value for research donors who can be assured that the research they are supporting will be disseminated efficiently.

Courses can also be used to strengthen relations to important stakeholders outside of academia, such as industry or civil society organisations. At the Faculty for Health and Medical Sciences the researchers behind the DIABETES course have actively used the course as a pretext to strengthen their relation to important stakeholders within diabetes research, such as the Danish Diabetes Academy, Novo Nordisk and Harvard Medical School.

Recruiting international students

A part of the University of Copenhagen's *2016 Strategy* is to increase internationalization, and one of the ways to do this is through improved recruitment of international students. Using MOOCs as an opportunity to recruit talented students from across the world is a motivation for most Universities that are involved in MOOC projects, and has also been a point of interest for the University of Copenhagen. Recruiting international talent can be a costly and time consuming affair, and the international competition between universities is tough.

In the following section we will discuss the possibilities and limitations, as they have been identified during the last two years. Most of our experiments have been done with the GLOBALHEALTH course, for two reasons. Firstly, the local academic environment behind the course allocated time and resources to actively examine the potential of recruiting via the MOOC, and secondly, the University of Copenhagen offers a wide range of relevant study programmes and short courses, all taught in English, within the overall field of global health.

> "Thanks for the great course professor Konradsen, It was a pleasure to be introduced to global health concepts and meet the staff of the MSc program at the University of Copenhagen. I look forward to applying to the MSc in Global Health at University of Copenhagen this week. All the best, - Michael"
>
> Learner feedback from GLOBALHEALTH-003

Following the demographic data about learners at the University of Copenhagen's MOOCs presented above it is clear that relevant study programmes are programmes targeted at either the Master's level or short courses for professionals.

What we set out to examine was if any of the applicants to global health related courses at the University of Copenhagen also took part in the GLOBALHEALTH course? And furthermore, which format of recruitment material is the most efficient?

To examine the amount of learners from the first or second session of the GLOBALHEALTH course, who also applied for a global health related course at the University of Copenhagen between September 2013 and September 2014, we compared the lists of email addresses used in Coursera user profiles and the list of email addresses used in two different application systems at the University of Copenhagen: the STADS-DANS Application Portal, used to manage applications for the MSc in Global Health, and the TopApply system used to manage applications for some of the School of Global Health's professional master's programmes, short courses and summer schools. The email addresses compared do not cover all global health related programmes and courses at the University and we cannot prove a direct causal relation between being a learner and an applicant, because the data do not show if they found the MOOC via Coursera's website or via information from the University of Copenhagen. However, the data can give us a rough estimate of overlap between the two groups.

Among the applicants in the TopApply system we identified all applicants who had started their application between 1 September 2013 and 1 September 2014. Of these there were 190 who also had been signed up for GLOBALHEALTH. In the STADS-DANS system there were 32 out of 173 applicants to the MSc in Global Health, who had also been signed up for the MOOC – of these 32 we know that 12 signed up after they were admitted to the programme. These findings indicate that there is indeed an opportunity to recruit international students via MOOCs, but that more data is needed to explore this potential in other areas, and to generate more knowledge about applicant quality and motivations and the transition from applicant to enrolled student.

To measure which recruitment initiatives were most efficient we added tracking codes to a number of links. The tracked links were available to the learners in two ways. One is in the *course room* on the Coursera platform, in form of a webpage with the title "Study in Copenhagen" that presented relevant study programmes and courses. The other is in emailed *announcements* sent out to all the people signed up for the MOOC.

Google Analytics data shows that a single announcement informing the learners of two relevant short courses offered by the University of Copenhagen's School of Global Health generated almost as many visits in a couple of days (817) than all the tracked course room links on the "Study in Copenhagen" page did during two full sessions of the course (837). This shows us that actively pushing key recruitment information

> "The Coursera course allowed me to not only sample the quality of course content, but also the teaching styles of professors, in the new MSc in Global Health. This helped me in my decision to choose the University of Copenhagen."
>
> **Nick from the United States, who was a learner on GLOBALHEALTH before starting his MSc in Global Health studies at University of Copenhagen**

to the entire population of the course is much more efficient than just keeping it in the course room. It also shows that using the announcement system is an extremely efficient way of getting strategic information, such as recruitment materials, out to a large number of potential applicants.

These findings show that recruitment through MOOCs is possible, but also that the full potential is still being explored. Departments that are creating MOOCs with the aim to attract international students to their courses should collaborate with local recruitment or PR specialists to tailor and optimize the communication with the learners and measure and compare the effect of different initiatives.

"As a University we are spending many resources on recruiting international students. Instead of relying only on advertisement campaigns, we can let prospective students sample the high quality of our programmes via the free and open course materials on Coursera. For courses in global health, where a diverse and international student body is a must, this is a very welcome development."

Helle Trøst Nielsen, Director of Studies, School of Global Health, University of Copenhagen

Status and next steps

Currently two new courses are in production, and a few more are being planned. With the current setup of the MOOC Unit it is expected that the University of Copenhagen will be able to produce 3-4 new MOOCs each year, plus make the necessary updates and improvements to already existing courses.

Migration to on-demand platform

One of the upcoming courses – *Bacteria and Chronic Infections* – will run once in May-June 2015 as a session-based course, and then transfer to Coursera's new on-demand platform in autumn 2015. The other upcoming course – *Synthetic Biology* – is being produced directly to go live as an on-demand course in November 2015.

Generally we consider the on-demand format as a great improvement, both for the flexibility and quality of the learner experience, the workload for lecturers and other course support staff, and the possibility to build and sustain growing communities of learners. Because of this we are planning to migrate all of the eight original courses to the new format in the last half of 2015, so that we, by the end of the year offer all the University of Copenhagen's MOOCs on-demand.

Sustainability of course economy

Since the summer of 2014 the University has been offering *Signature Track* on all sessions. Signature Track is a system where the learners, against a fee of USD 50, can have their identity verified by the Coursera platform (through webcam photos and typing pattern), and thus become eligible to earn a *Verified Certificate*. Even though the course materials are completely identical to those of the non-Signature Track, the Verified Certificate is considered a more valuable credential, especially for learners who want to show their results to current or future employers.

The revenue generated from Signature Track is shared between Coursera and the University, and so far the University of Copenhagen has had 1271 learners signing up for a Signature Track. Of these 30 % got financial support, that is, they applied to be exempted from payment, and got accepted on the Signature Track free of charge. The proportion of learners signing up, who also pay for a certificate vary between sessions (0.58 % – 1.19 %, average 0.90 %). The average translates to roughly DKK 150 000 (EUR 20 000) in revenue for the University of Copenhagen for every 100 000 learners signing up.

Although still limited, the revenue from Signature Track can make the course economy sustainable, by ensuring a flow of resources, which can be used on course moderation, updates, improvements and new additions to courses. The revenue is expected to increase with the transfer of all courses to the on-demand platform.

Integration into funding applications

An interesting next step is to focus more directly on donor value. Big research donors are increasingly requiring that applicants have a strategy for dissemination of the findings and outcomes of the project they want funded. Often this means building a website and a social media presence, having a press strategy, or taking part in conferences. The possibility to disseminate findings via a MOOC can lead to a much greater impact, and it should be examined if donors consider it meaningful to include MOOC production in the budgets of large applications for research funding.

Continuation of the project

From the onset of the project, it was decided that the first two years would serve as an explorative phase, where we investigated the possibilities of the MOOC format. This evaluation marks the end of this period, and the University of Copenhagen must thus decide which direction the MOOC production and collaboration with Coursera shall take from here.

Because of the University of Copenhagen's early start and substantial production, the University is now among just a handful of leading European universities when it comes to experience and know-how in relation to the MOOC format.

However, as suggested by the preliminary nature of the findings and lessons-learned presented above there is still much to be examined before we see the full extent to which MOOCs can improve relevance and quality of education, lecturer competencies, research dissemination, internationalization, university branding, and many other of the University's strategic goals.

The on-going platform improvements, that Coursera is introducing based on feedback from learners and partners such as the University of Copenhagen, also means that there is constantly new opportunities emerging. This means that the partnership with Coursera not only offers the University direct access to a huge global community of learners, but also insights into newest research based innovations within educational technology and experience with a state-of-the-art online education platform.

Recommendations

Based on the findings of this evaluation, and the many new opportunities opening up as the MOOC format is improved and developed, it seems advisable that the University of Copenhagen continues its partnership with Coursera.

However, the nature of the collaboration can of course take many forms, and is in the end completely dependent on the ability of the individual faculties and departments to fund the production of new courses.

Selection of topics for future courses

To get the maximum impact and the best return-of-investment it is clear that the selection of future course topics is also important. While the University of Copenhagen's MOOC Unit can advise on course format and share knowledge on different strategies, it is ultimately up to the faculties and departments to choose the topics of future courses. Better knowledge about the many uses of MOOCs and the way a MOOC can be used to achieve certain strategic goals should help inform the selection of course topics.

The dissemination of this evaluation internally at the University might be a step in this direction, but we also recommend that the relevant academic management (heads of studies, study directors, deans for education and outreach) enter into a conversation about the ways a MOOC can help them reach their local goals. This could be done either via visits from the University of Copenhagen's MOOC Unit, or in a discussion with their local member of the project steering committee.

Offering MOOCs on the right platform

Coursera was initially chosen as the University of Copenhagen's preferred partner because of the large number of learners, as well as the quality of the institutions already partnering with the platform.

As the industry develops, and different platforms appear, it is relevant to investigate if Coursera is still the right platform for the University of Copenhagen to partner with. There are numerous platforms out there. Many of them are national or regional, specializing in a certain language or course profile. Of truly global platforms, that are hosting a broad selection of English language courses at University level there are only four.

Platform	No. of users	Country	Business model	Who offers courses
Coursera	12 000 000	United States	Commercial	Mostly top universities
EdX	3 000 000	United States	Non-profit	Mostly top universities
FutureLearn	1 100 000	United Kingdom	Commercial	Mostly UK institutions
iversity	600 000	Germany	Commercial	Mostly European institutions

TABLE 10: PLATFORMS FOR MOOCS
COMPARISON OF FOUR PLATFORMS OFFERING ENGLISH LANGUAGE MOOCS AT UNIVERSITY LEVEL TO A GLOBAL AUDIENCE.
THE INDICATED NUMBERS OF USERS ARE THE NEWEST NUMBERS AVAILABLE, ALL REPORTED WITHIN THE LAST SIX MONTHS.

As indicated in table 10 there is a huge difference in the numbers of registered users on the different platforms. The user base on Coursera is four times bigger than its nearest competitor. If the University of Copenhagen values having a non-commercial partner then *EdX* is a good option. If a European partner is preferred, then the British *FutureLearn* and the German based *iversity* are both good options with a growing user base. There is however no doubt that Coursera is the world's leading platform, and none of the other top platforms offer the same reach. For that reason, we recommend that the University of Copenhagen continues its collaboration with Coursera. If it is decided to significantly expand the University of Copenhagen's work with open online education, it might be meaningful to offer on several platforms, but with the current investment we consider it best to focus the effort on the Coursera partnership.

Studying how we learn

The large amount of data about how the learners interact with the course materials gives a previously unimaginable insight into how we learn. The University of Copenhagen could leverage this by developing a focused research portfolio linked with open and online education.

Especially research examining learner motivation and learner feedback in MOOCs can be relevant for the University of Copenhagen's continuous work to improve quality and relevance of the University's study programmes, and at the same time have positive impact on student learning and completion time.

Open online education beyond MOOCs

Working with MOOCs has shown that open education is an efficient way of reaching out to a global audience. The global attention to the MOOC format has led to a great increase in the production of high quality open educational resources – not only universities, but also international organisations, special interest groups, governments, and private enterprises produce MOOCs and other free and open educational materials as a part of their knowledge dissemination and outreach strategy.

Contrary to open educational resources from previous decades, these new materials are not designed for educators to use in their teaching, but with the learners themselves as the primary consumer of the product. With increasing complexity of many professions and a need to keep learning through-out your career there is a rising demand for easy access courses and educational materials.

By entering the partnership with Coursera the University of Copenhagen has taken a first small step into the world of open educational resources. Already now the resources created for the MOOCs are being used in a large number of different settings, across the University of Copenhagen and beyond, both driven by the lecturers who were part of the project and by lecturers in other Universities, who reach out to ask permission to use lecture videos from the University of Copenhagen's MOOCs to teach the students of their own institutions.

In the survey of lecturers we found that 75 % of them agreed that the University of Copenhagen should share educational materials, such as the videos they helped create, under a license, which gives other lecturers, students and the general public the right to un-commercial, un-edited re-use of the materials in other contexts. Just 14 % were against the idea, and the last 11 % either did not know or had some reservations.

With a high degree of re-use already taking place, and this extra exposure undoubtedly helping to expand the reach of the learning resources and strengthening the brand of the University of Copenhagen, the logical next step is to embrace the principles of openness, and develop a progressive strategy for sharing this kind of materials with other institutions, organisations and life-long learners around the world. This can be done through adopting a Creative Commons licensing policy for all educational materials that are developed by the University, and building an online repository of open educational resources, which would make the University of Copenhagen a go-to place for a global community of learners seeking knowledge throughout their lives.

Such a policy of sharing educational resources and materials would also anticipate the requirements that are already now appearing from many donors who want that the findings from the research they support shall be efficiently disseminated both in the scientific community and beyond.
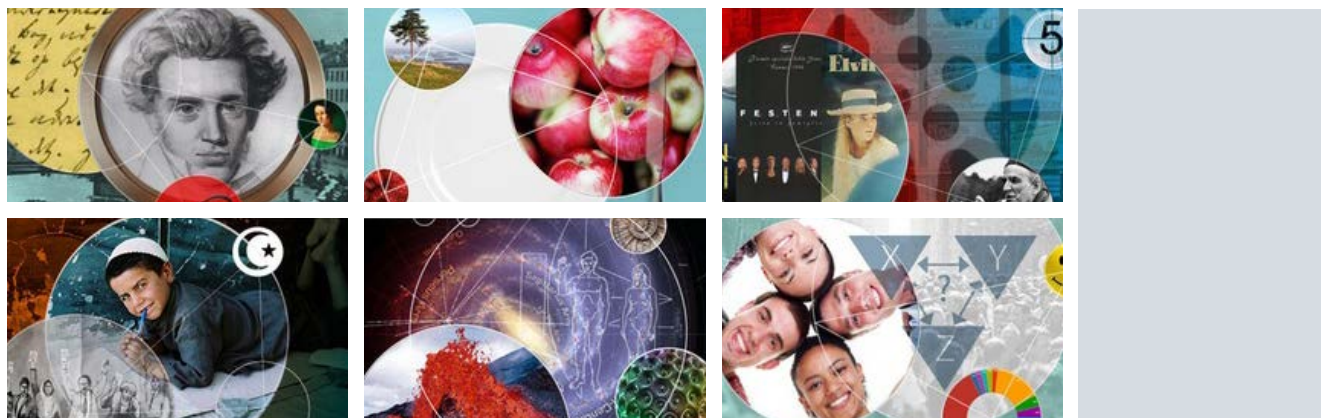
Overview of courses and course directors

An Introduction to Global Health

This course will provide you with an overview of the most important health challenges facing the world today. You will gain insight into how challenges have changed over time we will discuss the likely determinants of such changes and examine future projections. Successful international strategies and programs promoting human health will be highlighted and global health governance structures will be mapped and the role of the key actors explored.

Course director: Professor Flemming Konradsen

Faculty of Health and Medical Sciences

Constitutional Struggles in the Muslim World

Learn what motivates the restive Muslim youth from Tunis to Tehran, what political positions Islamists from Mali to Chechnya are fighting for, where the seeming obsession with Islamic law comes from, where the secularists have vanished to, and whether it makes sense to speak of an Islamic state.

Course director: Associate Professor Ebrahim Afsah

Faculty of Law

Diabetes - a Global Challenge

Diabetes is a growing health problem in rich and poor countries alike. With this course you will get updated on cutting-edge diabetes research including biological, genetic and clinical aspects as well as prevention and epidemiology of diabetes. All provided by high-profile scientists from one the world's leading universities in diabetes research.

Course directors: Professor Jens Juul Holst & Assistant Professor Signe S. Torekov

Faculty of Health and Medical Sciences

Measuring Causal Effects in the Social Sciences

How can we know if the differences in wages between men and women are caused by discrimination or differences in background characteristics? In this course we look at causal effects as opposed to spurious relationships. We will discuss how they can be identified in the social sciences using quantitative data, and describe how this can help us understand social mechanisms.

Course director: Professor Anders Holm

Faculty of Social Sciences

Origins - Formation of the Universe, Solar System, Earth and Life

The Origins course tracks the origin of all things – from the Big Bang to the origin of the Solar System and the Earth. The course follows the evolution of life on our planet through deep geological time to present life forms.

Course director: Associate Professor Henning Haack

Faculty of Science

Scandinavian Film and Television

In many ways Scandinavian film and television is a global cultural brand, connected with and exporting some of the cultural and social values connected to a liberal and progressive welfare society. This course deals with the social, institutional and cultural background of film and television in Scandinavia and in a broader European and global context.

Course director: Professor Ib Bondebjerg

Faculty of Humanities

Søren Kierkegaard - Subjectivity, Irony and the Crisis of Modernity

In this course we will explore how Kierkegaard deals with the problems associated with relativism, the lack of meaning and the undermining of religious faith that are typical of modern life. His penetrating analyses are still highly relevant today and have been seen as insightful for the leading figures of Existentialism, Post-Structuralism and Post-Modernism.

Course director: Associate Professor Jon Stewart

Faculty of Theology

The New Nordic Diet - from Gastronomy to Health

The New Nordic Diet is a new food culture which emphasizes gastronomy, health, and environment. This course presents the scientific background of the New Nordic Diet, the world's largest research project into adult and child health and well-being, and will help you better understand the global challenges such as obesity and obesity-related diseases.

Course director: Professor Arne Astrup

Faculty of Science